P2-100A

A Pentium® II or Deschutes Slot1 Processor based AGP mainboard (100/66MHz)

Manual Revision 4 2
SEP 05, 1998

The product name and revision number are both printed on the mainboard itself.

Handling Procedures

Static electricity can severely damage your equipment. Handle the P2-100A and any other device in your system with care and avoid unneccessary contact with system components on the mainboard.

Always work on an antistatic surface to avoid possible damage to the motherboard from static discharge.

We assume no responsibility for any damage to the P2-100A mainboard that results from failure to follow installation instructions or failure to observe safety precautions.

CAUTION

The P2-100A mainboard is subject to damage by static electricity. Always observe the handling procedures.

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Section 1
INTRODUCTION

Components Checklist

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✓   B.   (1)   P2-100A user's manual

✓   C.   (1)   Floppy ribbon cable

✓   D.   (1)   Hard drive ribbon cables

✓   E.   (1)   Foldable Retention Module

✓   F.   (1)   Retention Caps for celeron Processor

   G.   (2)   PS/2 to AT keyboard connector adapter (optional)

✓   H.   (1)   Bus master drivers

      (1)   AGP Drivers

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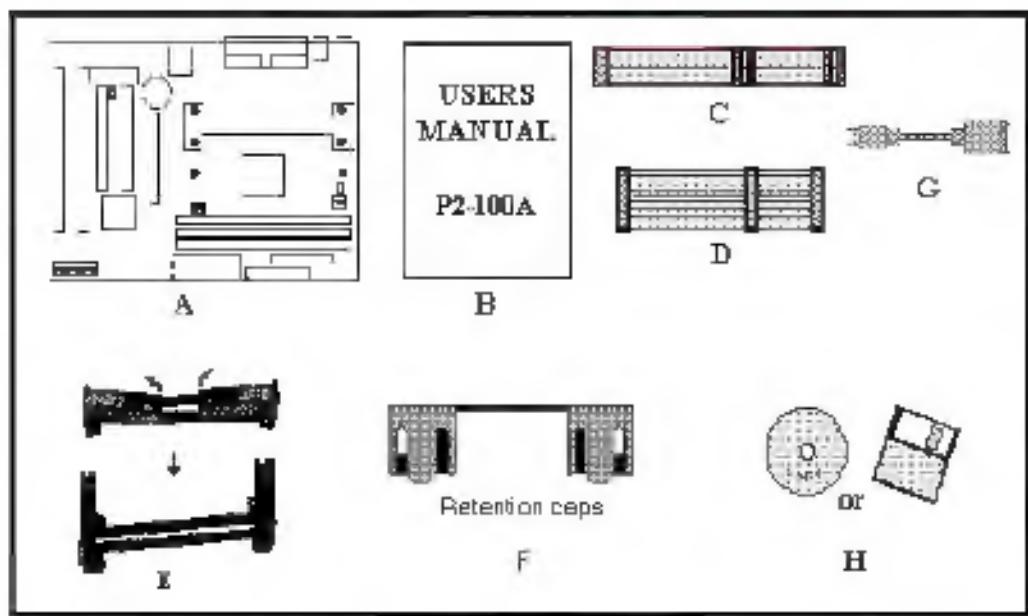
Overview

Pentium II or Deschutes Processor

The Pentium® II or Deschutes Processor (The Deschutes Processor as 300/100MHz, 350/100MHz, 400/100MHz and 450/100MHz speed with 512K-L2 cache Versions,) is the follow-on to the Pentium® Processor. The Pentium® II or Deschutes Processor, like the Pentium® Pro processor, implements a Dynamic Execution micro-architecture -- a unique combination of multiple branch prediction, data flow analysis, and speculative execution. This enables the Pentium® II Processor to deliver higher performance than the Pentium® processor, while maintaining binary compatibility with all previous Intel architecture processors.

A significant feature of the Pentium® II or Deschutes Processor, from a system perspective, is the built-in direct multiprocessing support. In order to achieve multiprocessing, and maintain the memory and I/O bandwidth to support it, new system designs are needed. For systems with dual processors, it is important to consider the additional power burdens and signal integrity issues of supporting multiple loads on a high speed bus. The Pentium® II or Deschutes Processor card supports both uni-processor and dual processor implementations.

The Pentium® II or Deschutes Processor utilizes Single Edge Contact (S.E.C.) (Figure 1) cartridge packaging technology. The S.E.C. cartridge allows the L2 cache to remain tightly coupled to the processor, while maintaining flexibility when implementing high performance processors into OEM systems. The second level cache is performance optimized and tested at the cartridge level. The S.E.C. cartridge utilizes surface mounted core components and a printed circuit board with an edge finger connection. The S.E.C. cartridge package introduced on the Pentium® II Processor will also be used in future Slot 1 processors.

The S.E.C. cartridge has the following features: a thermal plate, a cover and a PCB with an edge finger connection. The thermal plate allows standardized heatsink attachment or customized thermal solutions. The thermal plate enables a reusable heatsink to minimize fit issues for serviceability, upgradeability and replacement. The full enclosure also protects the surface mount components. The edge finger connection maintains socketability for system configuration. The edge finger connector is denoted as 'Slot 1 connector' in this and other documentation.

The entire enclosed product is called the Pentium® II or Deschutes Processor. The

packaging technology and each of the physical elements of the product are referred to using accurate technical descriptions. This allows clear reference to the products as just a processor. This is the model used in past packaging technologies like PGA, TCP, PQFP, DIP, etc.

S.E.C. Cartridge Terminology

- Pentium® II or Deschutes Processor
  The new enclosed card packaging technology is called a "Single Edge Contact cartridge." This is similar to previous names for packaging technology such as PGA or TCP.
- Processor card
  The green PCB (with or without components on it)
- Processor core
  The silicon on the PLGA package on the PCB
- Cover
  The plastic cover on the opposite side from the thermal plate
- Slot 1
  The slot that the S.E.C. cartridge plugs into, just as the Pentium® Pro processor uses Socket 8.
- Retention mechanism
  Formerly 'retention module' the dual posts, etc. that holds the cartridge in place.
- Thermal plate
  The heatsink attachment plate.
- Heat sink supports
  The support pieces that are mounted on the mainboard to provide added support for heatsinks.

The L2 cache (TagRAM, PBSRAM) components keep standard industry names.

The Pentium® II or Deschutes Processor is the first product to utilize the S.E.C. cartridge technology and Slot 1 connector. Unless otherwise noted, any references to "Pentium® II Processor," "Pentium® II or Deschutes Processor/ Slot 1 processor" or "Deschutes Processor" will apply to both the Pentium® II
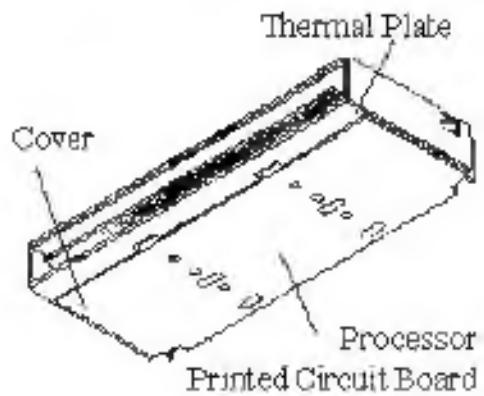
Figure 1: Pentium® II or Deschutes Processor CPU with S.E.C. Cartridge

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Processor desktop processors

Accelerated Graphics Port
(AGP or A.G.P.)

Typically, 3D graphics rendering requires a tremendous amount of memory, and demands ever increasing throughput speed as well. As 3D products for the personal computer become more and more popular, these demands will only increase. This will cause a rise in costs for both end users and manufacturers. Lowering these costs as well as improving performance is the primary motivation behind AGP. By providing a massive increase in the bandwidth available between the video card and the processor, it will assist in relieving some of these pressures for quite sometime.

Hardware Monitoring

Hardware monitoring allows you to monitor various aspects of your systems operations and status. These features include CPU temperature, voltage and RPM of fan.

P2-100A Form-Factor

The P2-100A is designed with Micro ATX form factor - the latest industry standard of chassis. The Micro ATX form factor is essentially a Baby-AT baseboard rotated 90 degrees within the chassis enclosure and a new mounting configuration for the power supply. With these changes the processor is relocated away from the expansion slots, allowing them all to hold full length add-in cards. Micro ATX defines a double height aperture to the rear of the chassis which can be used to host a wide range of onboard I/O. Only the size and position of this aperture is defined, allowing PC manufacturers to add new I/O features (e.g., TV input, TV output, joystick, modem, LAN, audio, etc.) to systems. This will help systems integrators differentiate their products in the marketplace, and better meet your needs.

- By integrating more I/O down onto the board and better positioning the hard drive and floppy connectors material cost of cables and add-in cards is reduced.

- By reducing the number of cables and components in the system, manufacturing time and inventory holding costs are reduced and reliability will increase.

- By using an optimized power supply, it's possible to reduce cooling costs and lower acoustical noise. A Micro ATX power supply, which has a side-mounted fan, allows direct cooling of the processor and add-in cards making a secondary fan or active heatsink unnecessary in most system applications
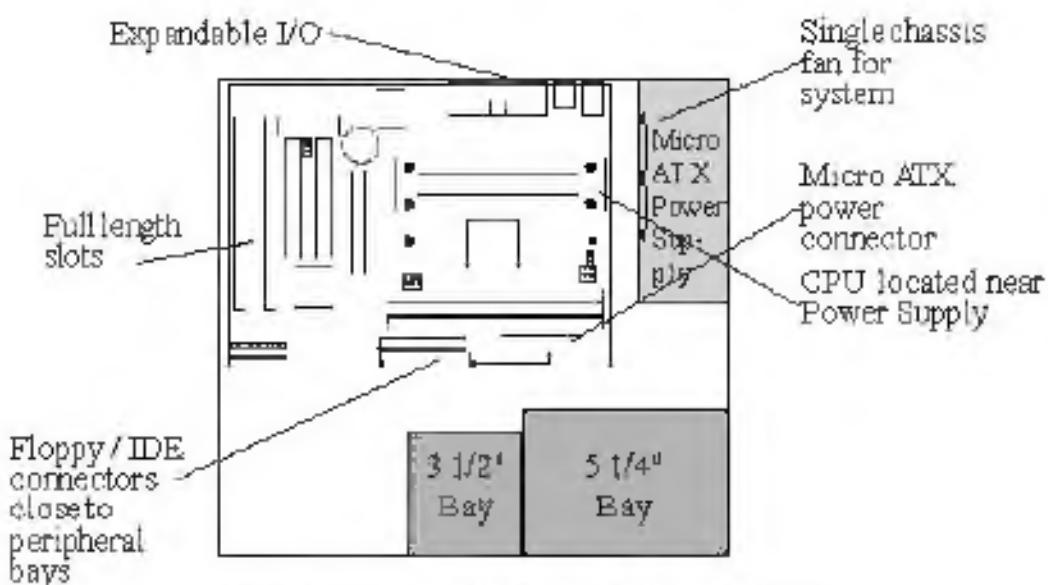
Figure 2: Summary of Micro ATX chassis features

I/O Shield Connector

The P2-100A is equipped with an I/O back panel.   Please use the appropriate I/O shield (figure 3).

*Figure 3:
P2-100A
I/O back
panel layout*

Parallel Port

PS/2 Mouse

PS/2 Keyboard

USB   COM1   COM2
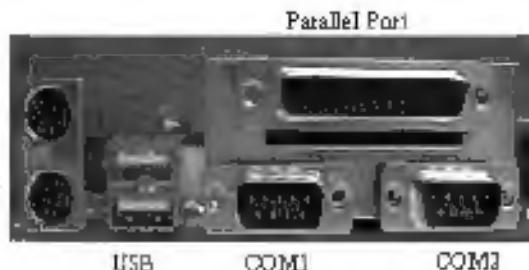
Power-On/Off (Remote)

The P2-100A has a single 20-pin connector for Micro ATX power supplies For Micro ATX power supplies that support the **Remote On/Off** feature, this should be connected to the systems front panel for system Power On/Off button. The systems power On/Off button should be a momentary button that is normally open

The P2-100A has been designed with "Soft Off" functions. You can turn Off the system from one of two sources: The first is the front panel Power On/Off button, and the other is the "Soft Off" function (coming from the P2-100A's onboard circuit controller) that can be controlled by the operating system. Windows 95 will control this when the user clicks that they are ready to Shutdown the system.

*Micro ATX
POWER SUPPLY*
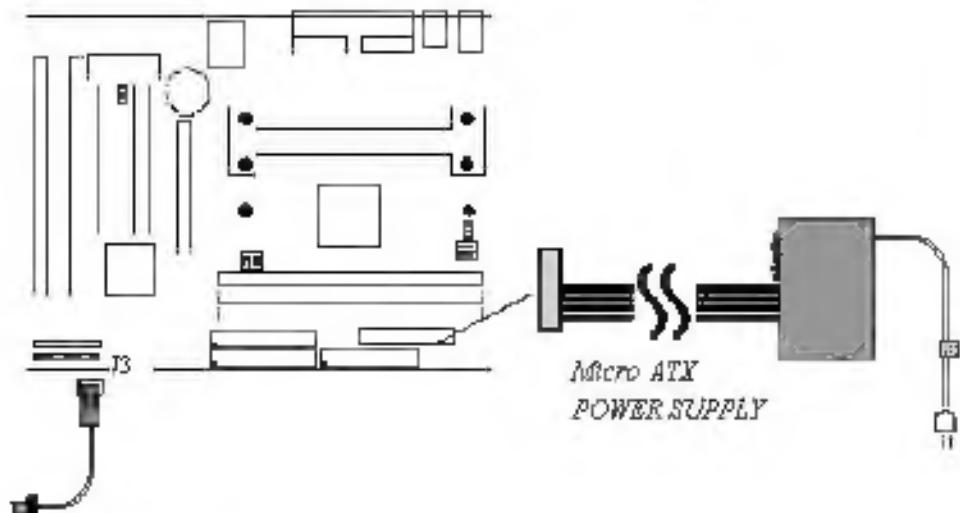
P2-100A Board
*Case (chassis) Power
ON/OFF button*

*Figure 4: Simple Micro ATX Power
ON/OFF Controller*

System Block Diagram
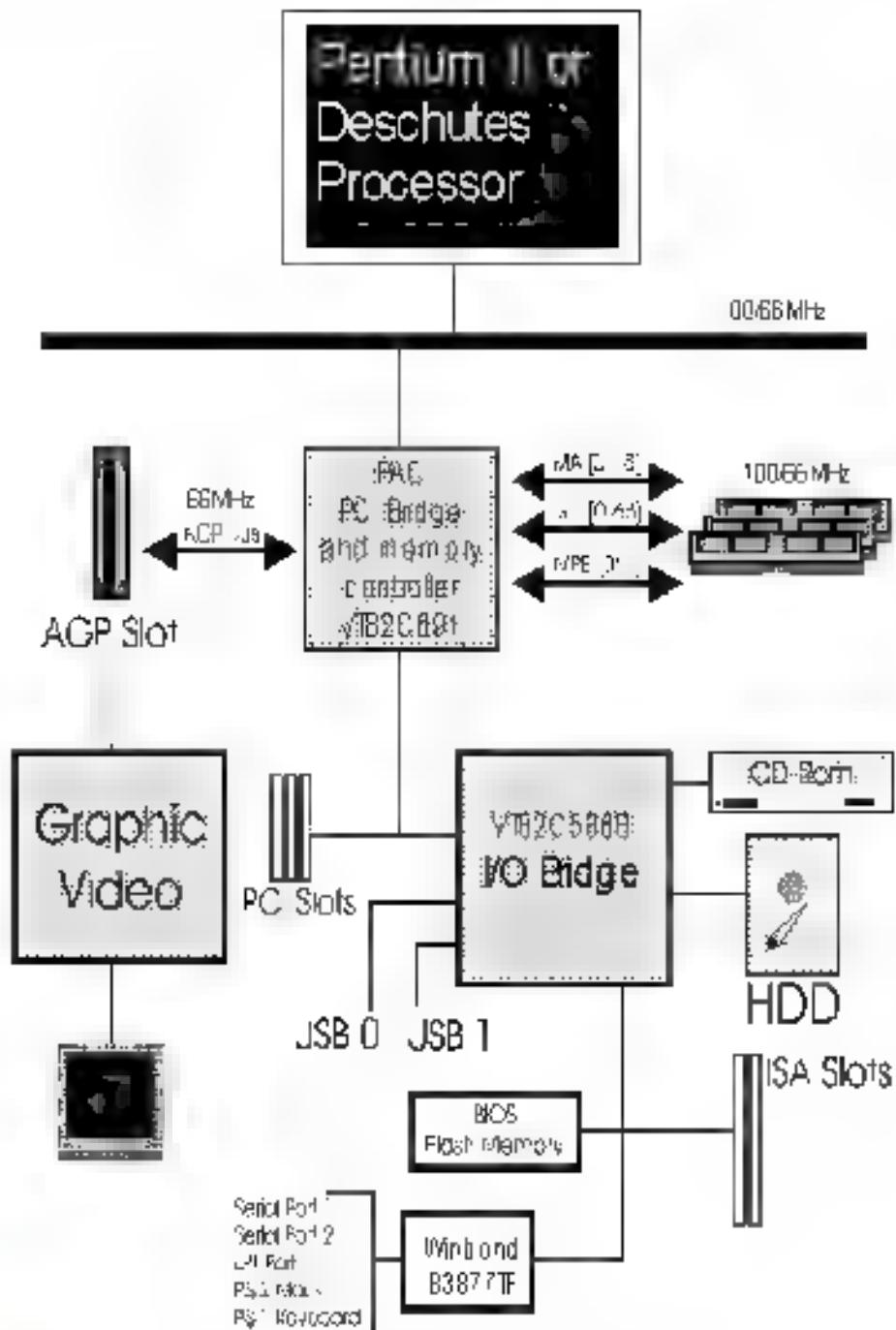
Figure 5   System Block Diagram

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Section 2
FEATURES

P2-100A eatures:

- P2 100A is based on the Pentium® II or Deschutes Processor operating at 233 ~ 333MHz (66MHz) or 300 ~ 550MHz (100MHz) on Slot 1. The board is configured by an DIP Switch to match your CPU clock speed.

- Designed with VIA APOLLO PRO AGP set.

- Supports up to 384 Mega of DRAM (minimum of 16 MB) on board. You can use 168 pin DIMM x 3. It will automatically detect Extended Data Output (EDO) DRAM at 66MHz only or Synchronous DRAM memory (SDRAM) at 66MHz or 100MHz (please see Section 3 2).

- P2 100A will support Error Checking and Correcting (ECC) when using paritys DRAM memory modules. This will detect multiple bit errors and correct 1 bit memory errors.

- Supports (2) 16 bit ISA slots, (2) 32 bit PCI slots, 1, AGP slot and provides (2 independent high performance PCI IDE interfaces capable of supporting PIO Mode 3 4 and Ultra DMA 33 devices. The P2 100A supports (2) PCI Bus Master slots and a jumperless PCI INT# control scheme which reduces configuration confus on when plugging in PCI card s.

- Supports ATAPI e g CD-ROM) devices on both Primary and Secondary IDE interfaces.

- Designed with Winbond W83877TF Multi I O 1 floppy port, parallel port (EPP ECP and (2) serial ports 16550 Fast UART) Note Japanese "Floppy 3 mode" is also supported.

- Includes a PS/2 mouse connector.

- Allows use of a PS/2 keyboard.

- Features Award Plug & Play BIOS. With Flash Memory you can always upgrade to the current BIOS as they are released. (http //www epox com please visit our Technical Support section for the atest updates)

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P2-100A Detailed Layout

Figure 1

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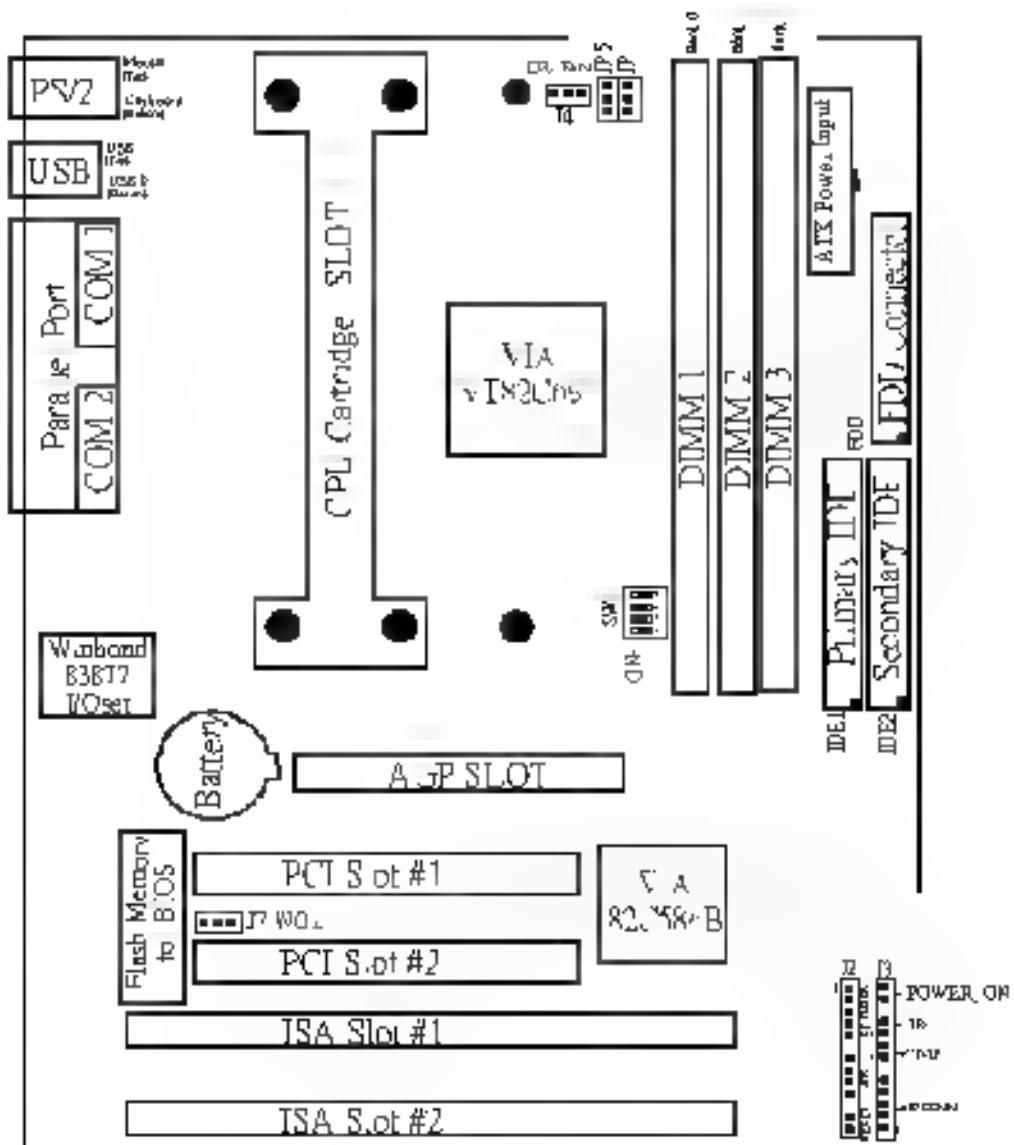
Easy Installation Procedure

Easy Installation Procedure

The following must be completed before powering on your new system

- 3-1   Configure DIP Switch to match your hardware
- 3-2   Install memory chips
- 3-3   Install Pentium II Processor
- 3-4   Device Connectors

Section 3-1
Configure DIP Switch

The P2-100A designs this motherboard with a DIP Switch to make your installation fast and easier

The following will describe all of the DIP Switch that you are required to set before moving on to step 3-2

Note: The DIP Switch as depicted as shown (Figure 1) in their correct physical orientation.
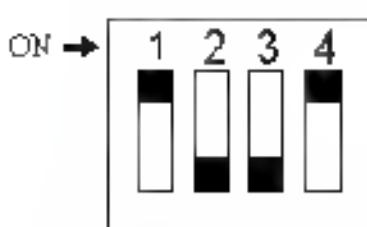
SW1				CPU	
1	2	3	4	66MHz	100MHz
ON		ON	ON	200	300
ON			ON	233	350
	ON	ON	ON	266	400
	ON		ON	300	450
		ON	ON	333	500

JP1   *CPU CLOCK Selection*
          1-2   AUTO Select by CPU
          2-3   Fix 100MHz

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Section 3-2
System Memory Configuration

Memory Layout

The P2-100A supports 3) 168-pin DIMMs (Dual In line Memory Module). The DIMMs can be either EDO (Enhanced Data Out) or SDRAM (Synchronized DRAM

- DIMM SDRAM may be 83MHz (12ns) 100MHz (10ns) or 20MHz (8ns) bus speed
- When using Synchronous DRAM we recommend using the 4 clock variety over the 2 clock

Figure 2 and Table 1 show several possible memory configurations using both SDRAM and EDO memory

DIMM 1	Bank 0
DIMM 2	Bank
DIMM 3	Bank 2

Synchronous EDO
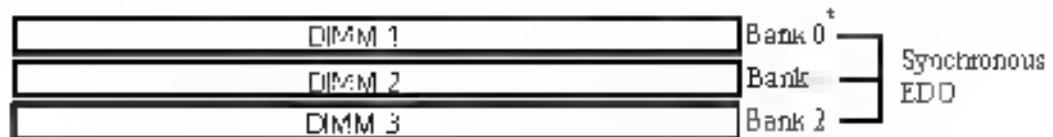
JP5 **SDRAM CLOCK Selection**
1-2 SDRAM=CPU (Default)
2-3 SDRAM=AGP (Fix at 66MHz)

Total Memory	DIMM 1 (Bank 0)	DIMM 2 (Bank 1)	DIMM 3 (Bank 2)
= 128MB Maximum	EDO/SDRAM* 8MB 16MB 32MB 64MB, 128MB X	None	None
= 256MB Maximum	EDO/SDRAM* 8MB 16MB 32MB 64MB, 128MB X	EDO/SDRAM* 8MB 16MB 32MB 64MB, 128MB X	None
= 384MB Maximum	EDO/SDRAM* 8MB 16MB 32MB, 64MB, 128MB X 1	EDO/SDRAM* 8MB 16MB 32MB 64MB, 128MB X 1	EDO/SDRAM* 8MB 16MB 32MB 64MB, 128MB X 1

SDRAM only supports 8, 16, 32, 64, 128MB DIMM modules

Table 2

DIMM Module Installation

Figure 5 displays the notch marks and what they should look like on your DIMM memory module.

DIMMs have 168 pins and two notches that will match with the onboard DIMM socket. DIMM modules are installed by placing the chip firmly into the socket at a 90 degree angle and pressing straight down (figure 6) until it fits tightly into the DIMM socket (figure 7).

LEFT KEY ZONE
(UNBUFFERED)

CENTER KEY ZONE
(3 V DRAM)

Figure 5

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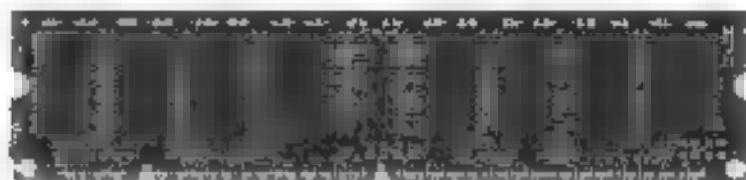
Total Memory	DIMM 1 (Bank 0)	DIMM 2 (Bank 1)	DIMM 3 (Bank 2)
= 128MB Maximum	EDO/SDRAM 8MB 16MB 32MB 64MB 128MB X 1	None	None
= 256MB Maximum	EDO/SDRAM 8MB 16MB 32MB 64MB 128MB X	EDO/SDRAM 8MB 16MB 32MB 64MB 128MB X	None
= 384MB Maximum	EDO/SDRAM* 8MB 16MB 32MB 64MB 128MB X 1	EDO/SDRAM* 8MB 16MB 32MB 64MB 128MB X	EDO/SDRAM* 8MB 16MB 32MB 64MB 128MB X

* SDRAM only supports 8, 16 32 64 128MB DIMM modules

Table

DIMM Module Installation

Figure 5 displays the notch marks and what they should look like on your DIMM memory module

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LEFT KEY ZONE
(UNBUFFERED)

CENTER KEY ZONE
(3.3V DRAM)

Figure 5

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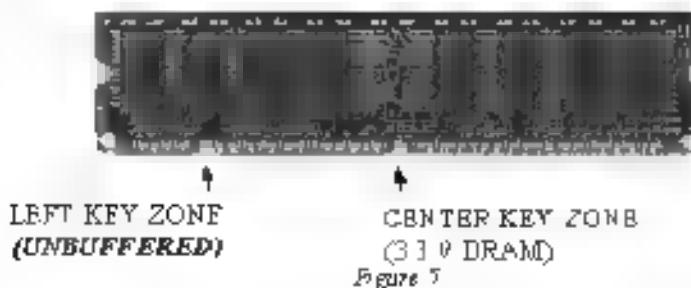
Section 3-3
Installing a Pentium II Processor

The P2-100A uses the Single Edge Contact (SEC) slot for a Pentium II processor packaged in an SEC cartridge. The SEC slot is not compatible with other non-Pentium II processors.

Please have ready the following list of components so that we may install the processor onto the motherboard.

1.   Heat sink support, top/bottom piece
2.   Pentium II processor heat sink
3.   Intel Pentium II Processor

OK, now that you have all of your components ready, we can start.

❶ First, please refer to figure 8 below, and follow the direction to lift up the fixed foldable pentium® II Retention Mechanism. This pre-installed device is designed for you to install Pentium® II CPU more easier and to avoide any damage on the board due to overtightening the four screws.

● One thing must be kept in your mind that please make sure to lift upright the foldable parts of the Retention module to fit and install CPU properly

Figure 8

Now we are going to install the heatsink support base piece (figure 9) onto the motherboard. There is both a large and small hole (figure 10) so that the base will only fit in one direction. This piece needs to be pushed into the holes firmly until it is seated.

Now we are ready to install the SEC Cartridge Pentium II Processor into the Retention Module. The SEC Cartridge is mounted by sliding the SEC Cartridge into the Retention Module and letting it slide all the way down. Once it reaches the

bottom make sure you press firmly on SEC cartridge to firmly secure into the Slot 1 Socket

Now we need to secure the heatsink with the top half of the support figure 11. Take the top piece of the support and slide it into the bottom fin (figure 11) on the heatsink and then push forward until it clips into the bottom base (figure 9) that is already there figure 11.

Figure 9

Figure 9 shows the layout of Slot 1 and the holes for mounting the Heatsink base piece (figure 8)

CPU Cartridge   SLOT 1   *Motherboard*

Layout

Large Hole for Heat Sink Base   *Small Hole for Heat Sink Base*

Figure 10

Bottom fin of heatsink   *Bottom fin of heatsink*

Top half of the support
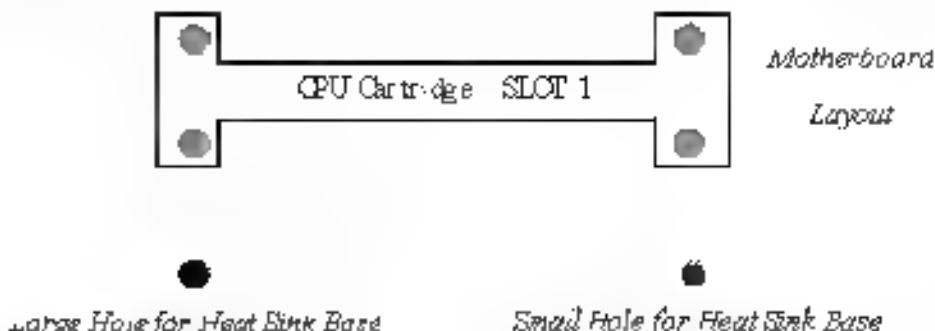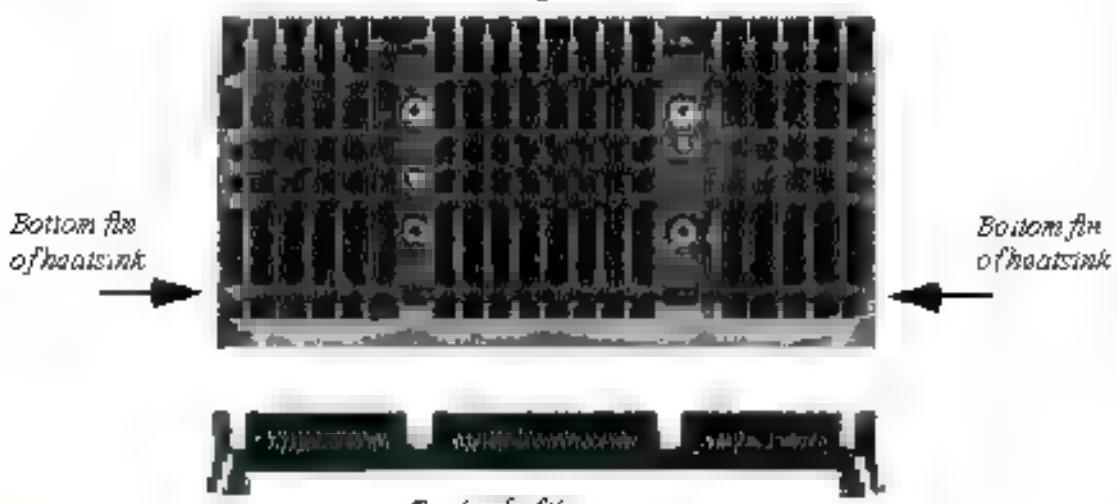
Figure 11

Section 3-4
Device Connectors

Please install the motherboard into the chassis

Now that your motherboard is installed you are ready to connect all your connections (figure 2
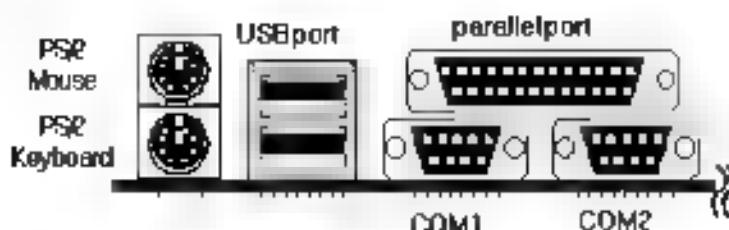
Figure 2

J2   Keylock, Speaker Reset

J3   IR Conn TB LED HDD LED POWER_ON

J4   CPU Fan Power
- A plug-in for the CPU Fan Power

J7   WOI (Wake on Lan Connector

IDE1   Primary IDE

IDE2   Secondary IDE

FDD1   Floppy Controller

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Section 3-4
Device Connectors (continued)

J2   1 ■   **KeyLock**   Keyboard lock switch & Power LED connector
            ■   1 Power LED(+   4 Keylock
            ■   2 N/C   5 GND
            ■   3 GND
            ■
            ■

      1 ■   **Speaker**   Connect to the system's speaker for beeping
            ■   1 Speaker   3 GND
            ■   2 N/C   4 GND
            ■
            ■

         ■   **Reset**   Closed to restart system
            ■

J3   1 ■   **IR Connector**
            ■   1 VCC   4 GND
            ■   2 NC   5 IRTX
            ■   4 IRRX
            ■
            ■

      + ■   **IDE LED indicator**   LED ON when Onboard PCI IDE Hard disks is
            ■   activate
      + ■   **Turbo LED indicator**   LED ON when higher speed is selected
            ■

         ■   **Power On/Off**   This is connected to the power button on the case
            ■   Using the Soft Off by Pwr. BTTN feature, you can choose either
                Instant Off (turns system off immediatly), or 4 sec. delay (you need to
                hold the button down for 4 seconds before the system turns off) When
                the system is in 4 sec. delay mode, P2-100A has added a special feature
                to make the system go into suspend mode when the button is pressed
                momentarily

Section 4
AWARD BIOS SETUP

BIOS Instructions

Award's ROM BIOS provides a built-in Setup program which allows user to modify the basic system configuration and hardware parameters. The modified data will be stored in a battery-backed CMOS, so that data will be retained even when the power is turned off. In general, the information saved in the CMOS RAM will stay unchanged unless there is a configuration change in the system, such as hard drive replacement or a device is added.

It is possible for the CMOS battery to fail, this will cause data loss in the CMOS only. If this does happen you will need to reconfigure your BIOS settings.

To enter the Setup Program

Power on the computer and press the <Del> key immediately this will bring you into the BIOS CMOS SETUP UTILITY.

```
                   ROM PCI   SA BIOS (2A6 FPA9)
                       CMOS SETUP UTILITY
                     AWARD SOFTWARE, INC.
```

STANDARD CMOS SETUP	SUPERVISOR PASSWORD
BIOS FEATURES SETUP	USER PASSWORD
CHIPSET FEATURES SETUP	DE HDD AUTO DETECTION
POWER MANAGEMENT SETUP	HDD LOW LEVEL FORMAT
PNP PCI CONFIGURATION	SAVE & EXIT SETUP
INTEGRATED PERIPHERALS	EXIT WITHOUT SAVING
LOAD SETUP DEFAULTS	

```
ESC  QUIT                         ↑ ↓ → ←   SELECT ITEM
F10  Save & Exit Setup            (Shift)F2  Change Color
```

Time, Date, Hard Disk Type

Figure 1   CMOS Setup Utility

The menu displays all the major selection items. Select the item you need to reconfigure. The selection is made by moving the cursor (press any direction key) to the item and pressing the Enter key. An on-line help message is displayed at the bottom of the screen as the cursor is moved to various items which provides a better understanding of each function. When a selection is made, the menu of the selected item will appear so that the user can modify associated configuration parameters.

4-1 Standard CMOS Setup

Choose "Standard CMOS Setup" in the CMOS SETUP UTILITY Menu (Figure 2). The Standard CMOS Setup allows the user to configure system settings such as the current date and time, type of hard disk drive installed, floppy drive type, and display type. Memory size is auto-detected by the BIOS and displayed for your reference. When a field is highlighted, use direction keys to move the cursor and the <Enter> key to select, the entries in the field can be changed by pressing the <PgDn> or the <PgUp> key.

```
ROM PCI/ISA BIOS(2A6LFPA9)
STANDARD CMOS SETUP
AWARD SOFTWARE, INC.

Date (mm:dd:yy)    Wed, Apr 1 1998
Time (hh:mm:ss)    14  30  50

HARD DISKS        TYPE  SIZE  CYLS  HEAD  PRECOMP  LANDZONE  SECTORS  MODE
Primary Master    Auto   0     0     0      0         0        0     Auto
Primary Slave     Auto   0     0     0      0         0        0     Auto
Secondary Master  Auto   0     0     0      0         0        0     Auto
Secondary Slave   Auto   0     0     0      0         0        0     Auto

Drive A   1.44M, 3.5 in
Drive B   None
Floppy 3 Mode Support  Disabled        Base Memory       640K
Video     EGA/VGA                      Extended Memory   64512K
Halt On   All But Keyboard             Other Memory      384K

                                       Total Memory      65536K

ESC  Quit          ↑ ↓ →    Select Item         PU/PD/+/-  Modify
F1   Help          (Shift)F2 Change Color
```

Figure 2   Standard CMOS Setup

NOTE If the hard disk Primary Master/Slave and Secondary Master/Slave are set to Auto, then the hard disk size and model will be auto-detected.

NOTE The "Halt On" field is used to determine when to halt the system by the BIOS if an error occurs

NOTE   Floppy 3 Mode support is a mode used to support a special 3 5" drive used in Japan. This is a 3.5" disk that stores only 1 2 MB the default setting for this is disabled.

BIOS Features Setup

Selecting the "BIOS FEATURES SETUP" option in the CMOS SETUP UTILITY menu allows users to change system related parameters in the displayed menu. This menu shows all of the manufacturer's default values for the P2 100A

Pressing the [F] key will display a help message for the selected item

```
ROM PCI/ISA BIOS(2A6LFPA9)
BIOS FEATURES SETUP
AWARD SOFTWARE INC
```

Virus Warning	Disabled	Video BIOS	Shadow	Enabled
CPU Internal Cache	Enabled	C8000-CBFFF	Shadow	Disabled
External Cache	Enabled	CC000-CFFFF	Shadow	Disabled
CPU L2 Cache ECC Checking	Enabled	D0000-D3FFF	Shadow	Disabled
Quick Power On Self Test	Enabled	D4000-D7FFF	Shadow	Disabled
Boot Sequence	A C SCSI	D8000-DBFFF	Shadow	Disabled
Swap Floppy Drive	Disable	DC000-DFFFF	Shadow	Disabled
Boot Up Floppy Seek	Enabled			
Boot Up Numlock Status	On			
Gate A20 option	Fast			
Memory Parity/ECC Check	Disabled			
Typematic Rate Setting	Disabled			
Typematic Rate (Chars/Sec)	6			
Typematic Delay (Msec	250			
Security Option	Setup	Esc Quit		↑ ↓ → ← Select Item
PCI/VGA Palette Snoop	Disabled	F1 Help		PU/PD/+/- Modify
OS Select For DRAM > 64MB	Non-OS 2	F5 Old Values		Shift) F2 Color
Report NO FDD For Win 95	NO	F7 Load Setup Defaults		

Figure 7   BIOS Features Setup

Virus Warning During and after the system boots up any attempt to write to the boot sector or partition table of the hard disk drive will halt the system and an error message will appear

You should then run an anti virus program to locate the virus Keep in mind that this feature protects only the boot sector not the entire hard drive
The default value is Disabled

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Enabled. Activates automatically when the system boots up causing a warning message to appear when anything attempts to access the boot sector

Disabled No warning message will appear when anything attempts to access the boot sector

Note: Many disk diagnostic programs that access the boot sector table can trigger the virus warning message. If you plan to run such a program, we recommend that you first disable the virus warning

CPU Internal Cache   This controls the status of the processor's internal cache area
The default is Enabled

Enabled. This activates the processor's internal cache thereby increasing performance
Disabled: This deactivates the processor's internal cache thereby lowering performance

External (L2) Cache   This controls the status of the external (L2) cache area
The default is Enabled

Enabled. This activates the motherboard's L2 cache thereby increasing performance
Disabled This deactivates the motherboard's L2 cache thereby lowering performance

Quick Power On Self Test   This category speeds up the Power On Self Test (POST)
The default is Enabled

Enabled This setting will shorten or skip of the items checked during POST
Disabled: Normal POST

Boot Sequence   This category determines which drive is searched first by the O.S Operating System,
The default is A C SCSI

The following is your list of options
[A, C, SCSI] [C, A, SCSI] [C, CD-ROM, A] [CD-ROM C, A]
[D, A CD-ROM],[E A, CD-ROM] [F, A, CD-ROM] [SCSI, A, C]
[SCSI, C, A] [C Only]

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Swap Floppy Drive   This will swap your physical drive letters A & B if you are using two floppy disks

The default is Disabled

>   ***Enabled***: *Floppy A & B will be swapped under the O.S.*
>   ***Disabled***: *Floppy A & B will be not swapped.*

Boot Up Floppy Seek   During Power On Self Test (POST) BIOS will determine if the floppy disk drive installed is 40 or 80 tracks. Only 360K type is 40 tracks while 760K, 1.2MB and 1.44MB are all 80 tracks

The default is Enabled

>   ***Enabled***   *The BIOS will search the floppy disk drive to determine if it is 40 or 80 tracks*
>   ***Disabled***: *The BIOS will not search for the type of floppy disk drive by track number*

>   *NOTE: BIOS can not tell the difference between 720K, 1.2MB and 1.44MB drive types as they are all 80 tracks.*

Boot Up NumLock Status   This controls the state of the NumLock key when the system boots

The default is On

>   ***On***   *The keypad acts as a 10-key pad.*
>   ***Off***: *The keypad acts like the cursor keys*

Gate A20 Option   This refers to the way the system addresses memory above 1MB (extended memory)

The default is Fast

>   ***Normal***   *The A20 signal is controlled by the keyboard controller or chipset hardware.*
>   ***Fast***: *The A20 signal is controlled by Port 92 or chipset specific method.*

Typematic Rate Setting   This determines the keystrokes repeat rate

The default is Disabled

>   ***Enabled***: *Allows typematic rate and typematic delay programming*
>   ***Disabled***: *The typematic rate and typematic delay will be controlled by the keyboard controller in your system*

Typematic Rate (Chars/Sec)   This is the number of characters that will be repeated by a keyboard press.
The default is 6

> **6.**   6 characters per second.   **8.**   8 characters per second
> **10**   10 characters per second   **12**   12 characters per second
> **15**   15 characters per second,   **20**   20 characters per second.
> **24**   24 characters per second.   **30**   30 characters per second.

Typematic Delay (msec)   This setting controls the time between the first and the second character displayed by typematic auto-repeat.
The default is 250

> **250**.   250 msec
> **500**   500 msec
> **750**.   750 msec
> **1000**   1000 msec

Security Option   This category allows you to limit access to the System and Setup or just to Setup
The default is Setup

> *System:* *The system will not boot and the access to Setup will be denied if the correct password is not entered at the prompt.*
> *Setup.*   *The system will boot, but the access to Setup will be denied if the incorrect password is not entered at the prompt*

PCI/VGA Palette Snoop   This field controls the ability of a primary PCI VGA controller to share a common palette When a snoop write cycles, with an ISA video card
The default is Disabled

> *Enabled.*   *If an ISA card is connected to a PCI VGA card via the VESA connector, and that ISA card connects to a VGA monitor, then that ISA card uses the RAMDAC of the PCI card.*
> *Disabled.*   *Disables the VGA card Palette Snoop function*

OS Select For DRAM > 64MB   Some operating systems require special handling Use this option only if your system has greater than 64MB of memory
The default is Non-OS2

> *OS2.* *Select this if you are running the OS/2 operating system with greater than 64MB of RAM*
> *Non-OS2.* *Select this for all other operating systems and configurations.*

Report No FDD For WIN95 This option allows BIOS to indicate whether WIN95 is with FDD or not. The Default value is NO.

NO: Report No FDD for WIN95

YES: Report FDD for WIN95

Video BIOS Shadow This option allows video BIOS to be copied into RAM Video Shadowing will increase the video performance of your system.
The default is Enabled.

Enabled: Video shadow is enabled.

Disabled: Video shadow is disabled.

C8000 CBFFF Shadow
CC000 CFFFF Shadow
D0000 D3FFF Shadow
D4000 D7FFF Shadow
D8000 DBFFF Shadow
DC000 DFFFF Shadow

These categories determine whether ROMs from option cards will be copied into RAM This will be in 16K byte or 32K byte units and the size will depend on chipset of the option card

Enabled: Optional shadow is enabled.

Disabled: Optional shadow is disabled

4-3 Chipset Features Setup

Choose the "CHIPSET FEATURES SETUP" in the CMOS SETUP UTILITY menu to display following menu.

```
ROM PCI/ISA BIOS (2A59 'PAB.
CHIPSET FEATURES SETUP
AWARD SOFTWARE, INC
```

Bank 0/1 DRAM Timing	Fast	Auto Detect DIMM/PCI Clk		Enabled
Bank 2/3 DRAM Timing	Fast	Speed Spectrum		Disabled
Bank 4/5 DRAM Timing	Fast	System/CPU Warning Temp		60nC/122m
		Current CPU Temp		32nC/89ºF
SDRAM Cycle Length	3	Current System Temp		0ºC/32ºF
SDRAM Bank Interleave	2 Bank	Current CPU Fan Speed		0 RPM
DRAM Page-Mode	Enabled	Vcore	2.83 V	Vtt	1.48 v
DRAM Read Latch Delay	2.0 nSec	3.3V	3.32 v	+5V	4.94 v
Memory Hole At 15Mb Addr	Disabled	+12V	13.16 v	2V	1.98 v
Read Around write	Disabled	v	-5.09 v		
Concurrent PCI/Host	Enabled				
Video RAM Cacheable	Enabled				
AGP Aperture Size	64M				
		Esc Quit		↑↓→← Select Item	
		F1 Help		PU/PD/+ Modify	
		F5 Old Value		(Shift) F2 Color	
		F7 Load Setup Defaults			

Figure 4   Chipset Features Setup

SDRAM Cycle length   This setting defines the CAS timing parameter of the SDRAM in terms of clocks.
The default is 3.

> **2:**   Provides faster memory performance.
> **3**   Provides better memory compatibility.

Video RAM Cacheable   This option allows the CPU to cache read/writes of the video RAM.
The default is Enabled

> ***Enabled.***   This option allows for faster video access.
> ***Disabled***   Reduced video performance.

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Memory Hole at 15M-16M   You can reserve this memory area for the use of ISA adaptor ROMs
The default is Disabled

Enabled   This field enables the main memory (15-16MB) to remap to ISA BUS.
Disabled: *Normal Setting.*

NOTE: *If this feature is enabled you will not be able to cache this memory segment*

AGP Aperture Size   The amount of system memory that the AGP card is allowed to share
The default is 64

4: *4MB of systems memory accessable by the AGP card*
8: *8MB of systems memory accessable by the AGP card.*
16: *16MB of systems memory accessable by the AGP card.*
32: *32MB of systems memory accessable by the AGP card.*
64: *64MB of systems memory accessable by the AGP card*
128: *128MB of systems memory accessable by the AGP card.*
256: *256MB of systems memory accessable by the AGP card,*

Auto Detect DIMM/PCI Clk   Allows you to stop DIMM/PCI Clock drive when the DIMM site or PCI Slot are not plug. This item may help reduce EMI

The default is Enabled

Enabled: *Provides unused DIMM/PCI to stop.*
Disabled. *Provides the clock generator always driving.*

Spread Spectrum Modulated: Allows you to active the Spread Spectrum Modulation function for reduce EMI (Note When Enabled the item that performance will be imparted)

The default is Disabled

Enabled: *Provides the Spread Spectrum function from clock generator.*
Disabled. *NO Spread Spectrum function.*

CPU Warning Temperature   This is the temperature that the computer will respond to an overheating CPU
The default is Disabled

Enabled   *Temperature is monitored on the CPU*
Disabled   *This feature is turned off*

Current CPU Temperature   This is the current temperature of the CPU

Current Power FAN Speed   The current power fan speed in RPMs

Current CPU FAN Speed   The current CPU fan speed in RPMs

Current Chassis FAN Speed   The current chassis fan speed in RPMs

CPU(V)   The voltage level of the CPU

+1.5V   The voltage level of the CPU's GTL+ Bus

+3.3V +5V +12V   The voltage level of the switch power supply

4-4 Power Management Setup

Choose the "POWER MANAGEMENT SETUP" in the CMOS SETUP UTILITY
to display the following screen. This menu allows the user to modify the power
management parameters and IRQ signals. In general, these parameters should not be
changed unless it is absolutely necessary.

```
                        ROM PCI/ISA BIOS  2A59IPAB)
                        POWER MANAGEMENT SETUP
                        AWARD SOFTWARE  INC

  Power Management      User Define    Primary INTR         ON
  PM Control by APM     Yes            IRQ3  (COM 2)        Primary
  Video off Option      Suspend > Off  IRQ4 (COM1)          Primary
  Video off Method      VH SYNC+Blank  IRQ5 (LPT 2)         Primary
  MODEM Use IRQ         3              IRQ6 (Floppy Disk)   Disabled
  Soft off by PWRBTN    Delay 4 Sec    IRQ7 (LPT 1)         Primary
  **PM Timers**                        IRQ8 (RTC Alarm)     Disabled
  HDD Power Down        Disable        IRQ9 (IRQ2 Redir)    Primary
  Doze Mode             1 Hour         IRQ10(Reserved)      Primary
  Suspend Mode          1 Hour         IRQ11(Reserved)      Primary
  ** PM Events **                      IRQ12(PS/2 Mouse)    Primary
  VGA                   OFF            IRQ13(Coprocessor)   Primary
  LPT & COM             LPT/COM        IRQ14(Hard Disk)     Primary
  HDD & FDD             ON             IRQ15(Reserved)      Disabled
  DMA/master            OFF
  Modem Ring Resume     Disabled       Es    Quit        ↑↓→←  Select Item
  RTC Alarm Resume      Disabled       F1    Help        PU/PD/+/-  Modify
                                       F5    Old Values  (Shift)F2   Color
                                       F7    Load Setup Defaults
```

Figure 5   Power Management Setup

You can only change the content of Doze Mode, Standby Mode, and Suspend Mode
when the Power Management is set to User Define

Power Management Use this to select your Power Management selection
The default is User define

> *Disabled*. The system operates in NORMAL conditions (Non-GREEN), and
> the Power Management function is disabled.
> *Max saving*. Maximum power savings. Inactivity period is 1 minute in each
> mode.
> *Min. saving*. Minimum power savings. Inactivity period is 1 hour in each
> mode.
> *User define*. Allows user to define PM Timers parameters to control power
> saving mode.

PM controlled APM This option shows weather or not you want the Power
Management to be controlled the Advanced Power Management (APM)
The default is Yes

> *Yes*. APM controls your PM
> *No*. APM does not control your PM

Video Off Method This option allows you to select how the video will be disabled
by the power management
The default is V/H Sync + Blank

> *V/H Sync + Blank* System turns off vertical and horizontal synchronization
> ports and writes blanks to the video buffer
> *DPMS* Select this option if your monitor supports the Display Power
> Management Signaling (DPMS standard of the Video Electronics Stan-
> dards Association (VESA) Use the software supplied for your video sub-
> system to select video power management values.
> *Blank Screen*. System only writes blanks to the video buffer

Video Off option Tells you what time frame that the video will be disabled under
current power management settings
The default is Standby

> *Standby*. Video powers off after time shown in standby mode setting.
> *Doze*. Video powers off after time shown in doze mode setting.
> *Suspend*. Video powers off after time shown in suspend mode setting.
> *N.A.* Video power off not controlled by power management

MODEM Use IRQ Name the interrupt request (IRQ) line assigned to the modem
if any on your system Activity of the selected IRQ always awakens the system

Default is IRQ 3

N/A. No IRQ is used.	3 IRQ 3
4. IRQ 4	5. IRQ 5
7 IRQ 7	9 IRQ 9
10 IRQ 10	11 IRQ 11

The EP-61APC M supports HDD Power Down, Doze and Standby power saving functions when using the Intel Pentium II Processor
The default is Disabled

Doze Mode   The "Doze" mode timer starts to count when no "PM events" have occurred

Suspend Mode   This function works only when the Pentium II Processor is installed   The timer starts to count when "System Standby" mode timer is timed out and no "PM Events" are occurring Valid range is from 1 minute up to 1 hour

HDD Power Down HDD Standby timer can be set from 1 to 15 minute(s)

VGA Active Monitor: Use this option if your monitor has advanced power saving features
The default is Enabled

   Enabled: Your monitor's power features will be included in power management.
   Disabled. Your monitor's power features will not be included in power management.

Soft-Off by PWR-BTTN Use this to select your soft-off function
The default is Delay 4 sec

   Instant Off Turns off instantly.
   Delay 4 Second Turns off after a 4 second delay. If momentary press of button the system will go into Suspend Mode. Press again to take system out of Suspend Mode.

Resume by Alarm This option allows you to have the system turn on at a preset time each day or on a certain day This option is only available when Power Loss Recovery is Enabled
The default is Enabled

   Enabled. The system will turn on at the preset time
   Disabled: The system will not turn on until you turn it on.

Date (of month) Alarm: This is how you set the date that the system will turn on. The default is 0

0   Setting this to 0 will turn the system on everyday at the preset time.
1-31   Represents the day of the month that you need the system to turn on

Time (hh:mm:ss) Alarm: This sets the time that you need the system to turn on The default is 08:00:00

4-5 PNP/PCI Configuration

The PNP/PCI configuration program is for the user to modify the PCI/ISA IRQ signals when various PCI/ISA cards are inserted in the PCI or ISA slots

WARNING: Conflicting IRQ's may cause the system to not find certain devices

```
              ROM PCI/ISA BIOS(2A6LFPA9)
              PNP/PCI CONFIGURATION
              AWARD SOFTWARE, INC
```

PNP OS Installed	No	CPU to PCI Write Buffer	Enabled
Resources Controlled By	Manual	PCI Dynamic Bursting	Enabled
Reset Configuration Data	Disabled	PCI Master 0 WS Write	Enabled
ACPI I/O Device Node	Enabled	PCI Delay Transaction	Enabled
IRQ-3 assigned to	Legacy ISA	PCI Master Read Prefetch	Enabled
IRQ-4 assigned to	Legacy ISA	PCI#2 Access #1 Retry	Disabled
IRQ-5 assigned to	PCI/ISA PnP	AGP Master 1 WS Write	Enabled
IRQ-7 assigned to	Legacy ISA	AGP Master 1 WS Read	Disabled
IRQ-9 assigned to	PCI/ISA PnP		
IRQ-10 assigned to	PCI/ISA PnP	PCI IRQ Actived By	Level
IRQ-11 assigned to	PCI/ISA PnP	Assign IRQ For USB	Enabled
IRQ-12 assigned to	PCI/ISA PnP	Assign IRQ For VGA	Enabled
IRQ-14 assigned to	Legacy ISA		
IRQ-15 assigned to	Legacy ISA		
DMA-0 assigned to	PCI/ISA PnP		
DMA-1 assigned to	PCI/ISA PnP	Esc Quit ↑↓→← Select Item	
DMA-3 assigned to	PCI/ISA PnP	F1 Help PU/PD/+/- Modify	
DMA-5 assigned to	PCI/ISA PnP	F5 Old Values (Shift) F2 Color	
DMA-6 assigned to	PCI/ISA PnP	F7 Load Setup Defaults	
DMA-7 assigned to	PCI/ISA PnP		

Figure 5   PCI Configuration Setup

PNP OS Installed: Do you have a PNP OS installed on your system The default is No

Yes   Select if you are using a PNP OS
No.   Select if your OS does not support PNP

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Resources Controlled By Who controlled the system PNP-PCI resources
The default is Manual.

Manual PNP Card's resources will be controlled manually. You can set
which IRQ-X and DMA-X are assigned to PCI/ISA PNP or Legacy ISA
Cards

Auto: If your ISA card and PCI card are all PNP cards, BIOS will assign
the interrupt resource automatically

Reset Configuration Data This setting allows you to clear ESCD data.
The default is Disabled

Disabled: Normal Setting.
Enabled: If you have plugged in some Legacy cards to the system and they
were recorded into ESCD (Extended System Configuration Data), you can
set this field to Enabled in order to clear ESCD.

PCI IDE IRQ Map To This item allows the user to configure the system for the
type of IDE hard disk controller in use. By default, the BIOS assumes that the hard
drive controller is an ISA device rather than a PCI controller. If you are using a PCI
controller, then you will need to change this to specify which PCI slot has the control-
ler and which PCI interrupt (A, B, C or D) is associated with the connected IDE
devices

Assign IRQ For USB This item allows BIOS to assign whether IRQ is with USB
or not. If you have not connect the USB device. Can release the IRQ for other
device

The default is Enabled

Enalbed: Provides IRQ for USB device
Disabled: Release IRQ for other device

4-8 Load Setup Defaults

The "LOAD SETUP DEFAULTS" function loads the system default data directly
from ROM and initializes the associated hardware properly. This function will be
necessary only when the system CMOS data is corrupted.

4-7 Integrated Peripherals

```
                           ROM  PCI/ISA  BIOS(2A6LFPA9)
                            INTEGRATED PERIPHERALS
                             AWARD SOFTWARE  INC
 ┌─────────────────────────────────────────────────────────────────────────────┐
 │ OnChip IDE First Channel      Enabled    Onboard Parallel Port      378/IRQ7  │
 │ OnChip IDE Second Channel     Enabled    Onboard Parallel Mode      ECP  EPP  │
 │ IDE Prefetch Mode             Enabled    ECP Mode Use DMA           3         │
 │ IDE HDD Block Mode            Enabled    Parallel Port EPP Type     EPP 1.9   │
 │ IDE Primary Master PIO        Auto       OnChip USB                 Disabled  │
 │ IDE Primary  Slave PIO        Auto                                            │
 │ IDE Secondary Master PIO      Auto                                            │
 │ IDE Secondary Slave PIO       Auto                                            │
 │ IDE Primary Master UDMA       Auto                                            │
 │ IDE Primary Slave UDMA        Auto                                            │
 │ IDE Secondary Master UDMA     Auto                                            │
 │ IDE Secondary Slave UDMA      Auto                                            │
 │ Init AGP Display First        Disabled                                        │
 │                                                                               │
 │ Onboard FDD Controller        Enabled    ↑↓→←  Select Item                    │
 │ Onboard Serial Port           Auto    Esc   Quit                             │
 │ Onboard Serial Port 2         Auto    F1    Help      PU/PD+/-   Modify      │
 │ UART 2 Mode                   Standard F5    Old Values  (Shift)F2  Color     │
 │                                       F7    Load Setup Defaults              │
 └─────────────────────────────────────────────────────────────────────────────┘
```

Figure 1   Integrated Peripherals

*Note: If you do not use the Onboard IDE connector then you will need to
set Onboard Primary PCI IDE Disabled and Onboard Secondary PCI
IDE Disabled
Note: The Onboard PCI IDE cable should be equal to or less than 18
inches (45 cm.)*

IDE HDD Block Mode IDE Block Mode allows the controller to access blocks
of sectors rather than a single sector at a time
The default is Enabled

> *Enabled.* Enabled IDE HDD Block Mode Provides higher HDD
> transfer rates.
> *Disabled.* Disable IDE HDD Block Mode.

Onchip IDE First Channel The default value is Enabled

> *Enabled* Enables Onboard IDE primary port
> *Disabled.* Disables Onboard IDE primary port.

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Onchip IDE Second Channel
The default is Enabled

  Enabled: Enables Onboard IDE secondary port
  Disabled: Disables Onboard IDE secondary port

IDE Primary Master PIO
The default is Auto

  Auto: BIOS will automatically detect the Onboard Primary Master PCI IDE
  HDD Accessing mode
  Mode 0- 4: Manually set the IDE Programmed interrupt mode.

IDE Primary Slave PIO
The default is Auto

  Auto: BIOS will automatically detect the Onboard Primary Slave PCI IDE
  HDD Accessing mode
  Mode 0- 4: Manually set the IDE Programmed interrupt mode.

IDE Secondary Master PIO
The default is Auto

  Auto: BIOS will automatically detect the Onboard Secondary Master PCI
  IDE HDD Accessing mode
  Mode 0- 4: Manually set the IDE Programmed interrupt mode.

IDE Secondary Slave PIO
The default is Auto

  Auto: BIOS will automatically detect the Onboard Secondary Slave PCI IDE
  HDD Accessing mode
  Mode 0- 4: Manually set the IDE Programmed interrupt mode

IDE Primary Master UDMA. This allows you to select the mode of operation for the hard drive
The default is Auto

  Auto: The computer will select the optimal setting
  Disabled: The hard drive will run in normal mode.

IDE Primary Slave UDMA. This allows you to select the mode of operation for the hard drive
The default is Auto

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Auto   *The computer will select the optimal setting.*
Disabled: *The hard drive will run in normal mode*

IDE Secondary Master UDMA This allows you to select the mode of operation for the hard drive
The default is Auto

    Auto. *The computer will select the optimal setting.*
    Disabled: *The hard drive will run in normal mode*

IDE Secondary Slave UDMA This allows you to select the mode of operation for the hard drive
The default is Auto

    Auto. *The computer will select the optimal setting.*
    Disabled. *The hard drive will run in normal mode*

USB Keyboard Support This controls the activation status of an optional USB keyboard that may be attached
The default is disabled.

    Enabled. *Enable USB keyboard support.*
    Disabled *Disable USB keyboard support*

Onboard FDC Controller This controls the state of the onboard floppy controller
The default value is Enabled

    Enabled. Enable the Onboard Winbond Chips's floppy drive interface controller.
    Disabled. Disable the Onboard Winbond Chips floppy drive interface controller.

Onboard Serial Port 1 This field allows the user to configure the 1st serial port
The default is Auto

    AUTO *Enable Onboard Serial port 1 and address is Auto adjusted*
    COM1 *Enable Onboard Serial port 1 and address is 3F8H IRQ4.*
    COM2 *Enable Onboard Serial port 1 and address is 2F8H IRQs*
    COM3 *Enable Onboard Serial port 1 and address is 3E8H IRQ4.*
    COM4 *Enable Onboard Serial port 1 and address is 2E8H IRQs*

Disabled. *Disable Onboard SMC CHIP's Serial port 1.*

Onboard Serial Port 2 This field allows the user to configure the 2nd serial port
The default is Auto

AUTO. *Enable Onboard Serial port 2 and address is Auto adjusted*
COM1 *Enable Onboard Serial port 2 and address is 3F8H/IRQ4*
COM2 *Enable Onboard Serial port 2 and address is 2F8H IRQ3*
COM3 *Enable Onboard Serial port 2 and address is 3E8H/IRQ4.*
COM4 *Enable Onboard Serial port 2 and address is 2E8H IRQ3*
Disabled. *Disable Onboard SMC CHIP's Serial port 2.*

UART Mode Select The mode of the IR Controller
The default is Normal

IrDA Support a Serial Infrared Interface IrDA

ASKIR Support a Sharp Serial Infrared Interface formats

Normal The IRRX and IRTX pins of IR function in normal condition

Onboard Parallel port This field allows the user to configure the LPT port
The default is 378H IRQ7

378H *Enable Onboard LPT port and address is 378H and IRQ7*
278H *Enable Onboard LPT port and address is 278H and IRQ5.*
3BCH *Enable Onboard LPT port and address is 3BCH and IRQ7*
Disabled: *Disable Onboard Winbond Chip's LPT port*

Parallel Port Mode This field allows the user to select the parallel port mode
The default is ECP+EPP

Normal. *Standard mode. IBM PC AT Compatible bidirectional parallel port.*
EPP *Enhanced Parallel Port mode*
ECP *Extended Capabilities Port mode.*
EPP+ECP *ECP Mode & EPP Mode.*

ECP Mode USE DMA This field allows the user to select DMA1 or DMA3 for
the ECP mode
The default is DMA3

DMA1 *This field selects the routing of DMA1 for the ECP mode.*

DMA3 This field selects the routing of DMA3 for the ECP mode

Power On Method There are "**Button Only**", "**Hot Key**" and "**Any key**" can be chosen by this field that allows users to select one of these various functions as Power On Method for their requirement

The default value in this selection is "Hot Key" Ctrl-F1.

Hot Key User can press "**Control Key**" (Ctrl) and "**Function Key**" (from F1 to F12) individually to power on the system.

The interval between "Ctrl" key and function Key (F1-F12) must be short.

Anykey: Press anykey to power on the system.

Button Only This power on method is controlled by F3 (pw-on) Use Power On Button to power on the system.

Password: User can Power On the System by password, the password can be entered from 1 to 5 characters. The maximum of password is 5 characters

If user forget / lost the password, please go into BIOS setting to change the Power On Method, or keyin another words as password instead of original one.

4-8 Change Supervisor or User Password

To change the password, choose the "SUPERVISOR PASSWORD or USER PASSWORD" option from the CMOS SETUP UTILITY menu and press [Enter]

NOTE: Either "Setup" or "System" must be selected in the "Security Option" of the BIOS FEATURES SETUP menu.

1. If CMOS is corrupted or the option was not used, a default password stored in the ROM will be used. The screen will display the following message

   Enter Password

   Press the [Enter] key to continue after the proper password is given

2. If the CMOS is corrupted or the option was used earlier and the user wishes to change the default password, the SETUP UTILITY will display a message and ask for a confirmation

   Confirm Password

3   After pressing the [Enter] key (ROM password if the option was not used) or current password (user defined password), the user can change the password and store new one in CMOS RAM. A maximum of 8 characters can be entered.

4-8 IDE HDD Auto Detection

The "IDE HDD auto detection" utility is a very useful tool, especially when you do not know which kind of hard disk type you are using. You can use this utility to detect the correct disk type installed in the system automatically. But now you can set HARD DISK TYPE to Auto in the STANDARD CMOS SETUP. You don't need the "IDE HDD AUTO DETECTION" utility. The BIOS will Auto detect the hard disk size and model on display during POST.

```
                    ROM PCI/ISA BIOS(2A6LFPA9)
                        CMOS SETUP  UTILTY
                      AWARD SOFTWARE  INC

HARD DISKS      TYPE  SIZE  CYLS  HEADS  PRECOMP  LANDZONE  SECTORS  MODE

Primary Master


                  Select Secondary Slave Option (N=Skip)  N

    OPTIONS   SIZE    CYLS     HEAD    PRECOMP      LANDZ SECTOR MODE

    2 (Y)     4310    524      44         0         14847    63  LBA
              4310    4848      9       65533        14847    63  NORMAL
    3         4310    928      44       65533        14847    63  LARGE

    Note  Some OS+s  (like  SCO-UHIX)  must  use  NORMAL  for  installation

                    ===| ESC  Skip |===
```
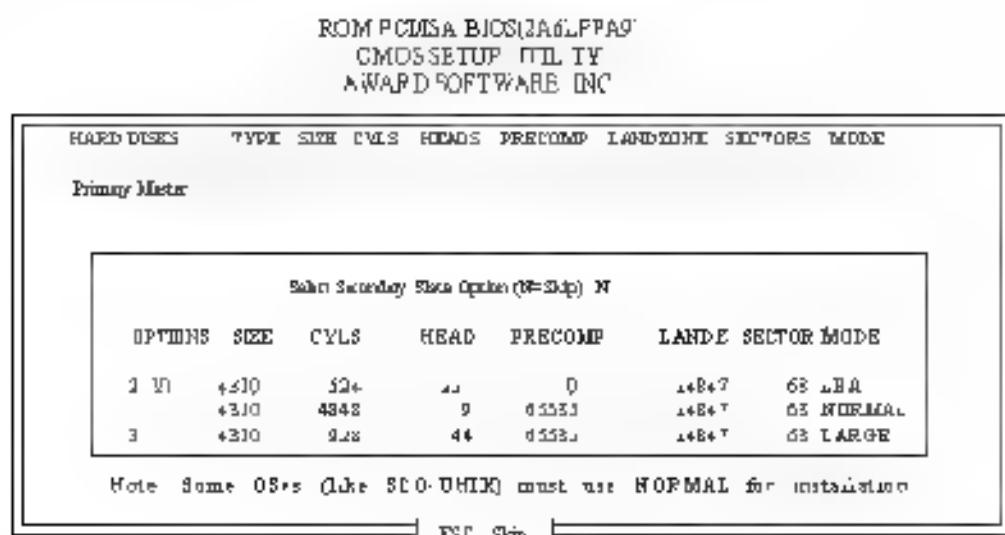
Figure 8   IDE HDD Auto Detection

NOTE HDD Modes

The Award BIOS supports 3 HDD modes   NORMAL, LBA & LARGE NORMAL mode

Generic access mode in which neither the BIOS nor the IDE controller will make any transformations during accessing.

The maximum number of cylinders head & sectors for NORMAL mode are

```
1024, 16 & 63
no Cylinder          1024
x no Head            6
x no Sector          63)
x no. per sector     5.2)
                     528 Megabytes
```

If user set his HDD to NORMAL mode, the maximum accessible HDD size will be 528 Megabytes even though its physical size may be greater than that.

LBA (Logical Block Addressing) mode   A new HDD accessing method to overcome the 528 Megabyte bottleneck. The number of cylinders, heads & sectors shown in setup may not be the number physically contained in the HDD. During HDD accessing, the IDE controller will transform the logical address described by sector, head & cylinder into its own physical address inside the HDD. The maximum HDD size supported by LBA mode is 8.4 GigaBytes which is obtained by the following formula

```
no Cylinder          (1024
x no Head            255)
x no Sector          63
x bytes per sector   5.2)
                     8.4 GigaBytes
```

LARGE mode   Extended HDD access mode supported by Award Software

Some IDE HDDs contain more than 1024 cylinder without LBA support. In some cases, user do not want LBA. The Award BIOS provides another alternative to support these kinds of LARGE mode

CYLS	HEADS	SECTOR	MODE
1120	6	59	NORMAL
560	32	59	LARGE

BIOS tricks DOS' or other OS' that the number of cylinders is less than 1024 by dividing t by 2. At the same time, the number of heads is multiplied by 2. A reverse transformation process will be made inside

INT 13h in order to access the right HDD address

Maximum HDD size

no. Cylinder	1024)
x no. Head	32
x no. Sector	63)
x bytes per sector	512)
	1 GigaByte

Note: To support LBA or LARGE mode of HDDs, there must be some software involved. All the software is located in the Award HDD Service Routine (INT 13h). It may fail to access a HDD with LBA (LARGE) mode selected if you are running under an Operating System which replaces the whole INT 13h.

UNIX operating systems do not support either LBA or LARGE and must adhere the Standard mode. UNIX can support drives larger than 528MB.

4-10 HDD Low Level Format

Interleave Select the interleave number of the hard disk drive you wish to perform a low level format on. You may select from 1 to 8. Check the documentation that came with the drive for the correct interleave number, or select 0 for automatic detection.

Auto scan bad track This allows the utility to scan first then format by each track.

Start Press <Y> to start low level format.

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A-1 MEMORY MAP

Address Range	Size	Description
[00000-7FFFF]	512K	Conventional memory
[80000-9FBFF]	127K	Extended Conventional memory
[9FC00-9FFFF]	1K	Extended BIOS data area if PS/2 mouse is installed
[A0000-C7FFF]	160K	Available for Hi DOS memory
[C8000-DFFFF]	96K	Available for Hi DOS memory and adapter ROMs
[E0000-EEFFF]	60K	Available for UMB
[EF000-EFFFF]	4K	Video service routine for Monochrome & CGA adaptor
[F0000-F7FFF]	32K	BIOS CMOS setup utility
[F8000-FCFFF]	20K	BIOS runtime service routine (2)
[FD000-FDFFF]	4K	Plug and Play ESCD data area
[FE000-FFFFF]	8K	BIOS runtime service routine (1)

A-2 I/O MAP

[000-01F]	DMA controller (Master)
[020-021]	INTERRUPT CONTROLLER (Master)
[022-023]	CHIPSET control registers 10 ports
[040-05F]	TIMER control registers
[060-06F]	KEYBOARD interface controller (8042)
[070-07F]	RTC ports & CMOS I/O ports
[080-09F]	DMA register
[0A0-0BF]	INTERRUPT controller (Slave)
[0C0-0DF]	DMA controller (Slave)
[0F0-0FF]	MATH COPROCESSOR
[1F0-1F8]	HARD DISK controller
[278-27F]	PARALLEL port 2
[2B0-2DF]	GRAPHICS adapter controller
[2F8-2FF]	SERIAL port 2
[360-36F]	NETWORK ports
[378-37F]	PARALLEL port
[3B0-3BF]	MONOCHROME & PARALLEL port adapter
[3C0-3CF]	EGA adapter

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[3D0-3DF]	CGA adapter
[3F0-3F7]	FLOPPY DISK controller
[3F8-3FF]	SERIAL port 1

A-3 TIMER & DMA CHANNELS MAP

TIMER MAP

TIMER Channel 0	System timer interrupt
TIMER Channel 1	DRAM REFRESH request
TIMER Channel 2	SPEAKER tone generator

DMA CHANNELS

DMA Channel 0	Available
DMA Channel 1	Onboard ECP (Option
DMA Channel 2	FLOPPY DISK (SMC CHIP)
DMA Channel 3	Onboard ECP (default)
DMA Channel 4	Cascade for DMA controller 1
DMA Channel 5	Available
DMA Channel 6	Available
DMA Channel 7	Available

A-4 INTERRUPT MAP

NMI

Parity check error

IRQ (H/W)

0	System TIMER interrupt from TIMER 0
1	KEYBOARD output buffer full
2	Cascade for IRQ 8-15
3	SERIAL port 2
4	SERIAL port 1
5	PARALLEL port 2
6	FLOPPY DISK (SMC CHIP)
7	PARALLEL port 1
8	RTC clock
9	Available
10	Available
11	Available
12	PS/2 Mouse
13	MATH coprocessor

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14	Onboard HARD DISK (IDE channel)
5	Onboard HARD DISK (IDE channel)

A-5 RTC & CMOS RAM MAP

	RTC & CMOS
00	Seconds
01	Second alarm
02	Minutes
03	Minutes alarm
04	Hours
05	Hours alarm
06	Day of week
07	Day of month
08	Month
09	Year
0A	Status register A
0B	Status register B
0C	Status register C
0D	Status register D
0E	Diagnostic status byte
0F	Shutdown byte
10	FLOPPY DISK drive type byte
11	Reserve
12	HARD DISK type byte
13	Reserve
14	Equipment type
15	Base memory low byte
16	Base memory high byte
17	Extension memory low byte
18	Extension memory high byte
19-2d	
2E-2F	
30	Reserved for extension memory low byte
31	Reserved for extension memory high byte
32	DATE CENTURY byte
33	INFORMATION FLAG
34-3F	Reserve
40-7F	Reserved for CHIPSET SETTING DATA

B-1 POST CODES

ISA POST codes are typically output to I/O port address 80h

POST (hex)	DESCRIPTION
01-02	Reserved
C0	Turn off OEM specific cache, shadow
03	1. Initialize EISA registers (EISA BIOS only)
	2. Initialize all the standard devices with default values
	Standard devices includes:
	DMA controller (8237)
	Programmable Interrupt Controller (8259)
	Programmable Interval Timer (8254)
	RTC chip
04	Reserved
05	1. Keyboard Controller Self-Test
06	2. Enable Keyboard Interface
07	Reserved
08	Verifies CMOS's basic R/W functionality
C1	Auto-detection of onboard DRAM & Cache
C5	Copy the BIOS from ROM into E0000-FFFFF shadow RAM so that POST will go faster
08	Test the first 256K DRAM
09	OEM specific cache initialization (if needed)
0A	1. Initialize the first 32 interrupt vectors with corresponding Interrupt handlers. Initialize INT numbers from 33-120 with Dummy (Spurious) Interrupt Handler
	2. Issue CPUID instruction to identify CPU type
	3. Early Power Management initialization (OEM specific)
0B	1. Verify the RTC time is valid or not
	2. Detect bad battery
	3. Read CMOS data into BIOS stack area
	4. PnP initializations including (PnP BIOS only)
	Assign CSN to PnP ISA card
	Create resource map from ESCD
	5. Assign IO & Memory for PCI devices (PCI BIOS only)

0C	Initialization of the BIOS Data Area (40:0N – 40:FF)
0D	1. Program some of the Chipset's value according to Setup. (Early Setup Value Program)
	2. Measure CPU speed for display & decide the system clock speed.
	3. Video initialization including Monochrome, CGA, EGA/VGA. If no display device found, the speaker will beep
0E	1. Test video RAM. (If Monochrome display device found)
	2. Show messages including
	▸ Award Logo, Copyright string, BIOS Data code & Part No.
	– OEM specific sign on messages
	– Energy Star Logo. (Green BIOS ONLY)
	– CPU brand, type & speed
	▸ Test system BIOS checksum. (Non-Compress Version only)
0F	DMA channel 0 test.
10	DMA channel 1 test.
11	DMA page registers test.
12-13	Reserved.
14	Test 8254 Timer 0 Counter 2.
15	Test 8259 interrupt mask bits for channel 1.
16	Test 8259 interrupt mask bits for channel 2.
17	Reserved.
19	Test 8259 functionality.
1A-1D	Reserved.
1E	If EISA NVM checksum is good, execute EISA initialization. (EISA BIOS only)
1F-29	Reserved.
30	Detect Base Memory & Extended Memory Size
31	1. Test Base Memory from 256K to 640K.
	2. Test Extended Memory from 1M to the top of memory
32	1. Display the Award Plug & Play BIOS Extension message. (PnP BIOS only)
	2. Program all onboard super I/O chips (if any) including COM ports, LPT ports, FDD port ... according to setup value.
33-3B	Reserved.
3C	Set flag to allow users to enter CMOS Setup Utility.
3D	1. Initialize Keyboard
	2. Install PS2 mouse.

3E	Try to turn on Level 2 cache.
	Note: Some chipset may need to turn on the L2 cache in this stage. But usually, the cache is turn on later in POST 61h.
3F-40	Reserved.
BF	1. Program the rest of the Chipset's value according to Setup (Later Setup Value Program)
41	2. If auto-configuration is enabled, program the chipset with pre-defined Values.
42	Initialize floppy disk drive controller.
43	Initialize Hard drive controller.
45	If it is a PnP BIOS, initialize serial & parallel ports.
44	Reserved.
45	Initialize math coprocessor.
46-4D	Reserved.
4E	If there is any error detected (such as video, kb...), show all error messages on the screen & wait for user to press <F1> key
4F	1. If password is needed, ask for password.
	2. Clear the Energy Star Logo. (Green BIOS only)
50	Write all CMOS values currently in the BIOS stack area back into the CMOS.
51	Reserved.
52	1. Initialize all ISA ROMs.
	2. Later PCI initializations. (PCI BIOS only)
	- assign IRQ to PCI devices.
	- initialize all PCI ROMs.
	3. PnP Initializations. (PnP BIOS only)
	- assign IO, Memory, IRQ & DMA to PnP ISA devices.
	- initialize all PnP ISA ROMs
	4. Program shadows RAM according to Setup settings.
	5. Program parity according to Setup setting
	6. Power Management Initialization.
	- Enable/Disable global PM
	- APM interface initialization.
53	1. If it is NOT a PnP BIOS, initialize serial & parallel ports.
	2. Initialize time value in BIOS data area by translate the RTC time value into a timer tick value.
60	Setup Virus Protection. (Boot Sector Protection) functionality according to Setup setting.

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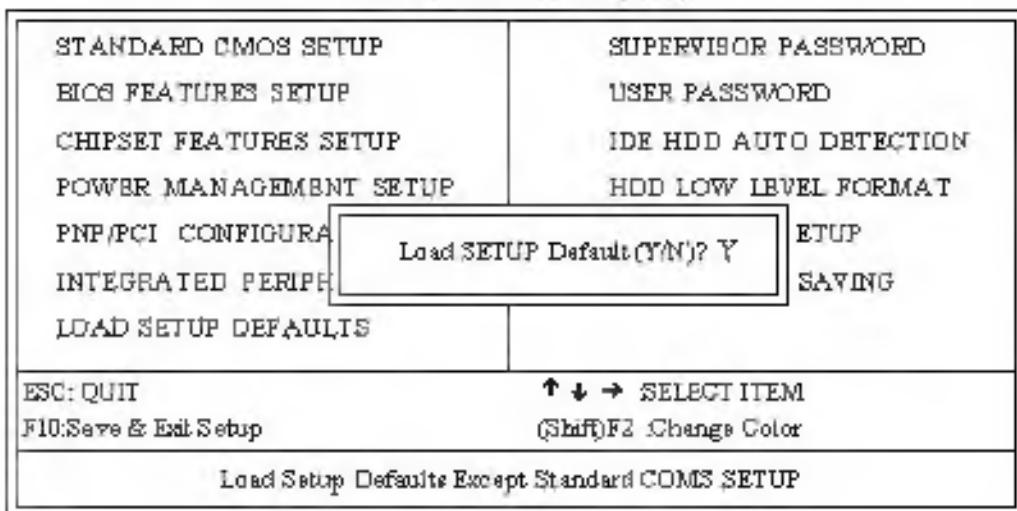|	
61	1. Try to turn on Level 2 cache. Note: If L2 cache is already turned on in POST 3D, this part will be skipped. 2. Set the boot up speed according to Setup setting. 3. Last chance for Chipset initialization. 4. Last chance for Power Management initialization. (Green BIOS only) 5. Show the system configuration table.
62	1. Setup daylight saving according to Setup value. 2. Program the NUM Lock, typematic rate & typematic speed according to Setup setting.
63	1. If there is any changes in the hardware configuration, update the ESCD information. (PnP BIOS only) 2. Clear memory that have been used. 3. Boot system via INT 19H.
FF	System Booting. This means that the BIOS already pass the control right to the operating system.

B-2 Unexpected Errors:

POST (hex)	DESCRIPTION
B0	If interrupt occurs in protected mode
B1	Unclaimed NMI occurs 0

NOTE:
The "**LOAD SETUP DEFAULTS**" function loads the system default data directly from ROM and initializes the associated hardware properly. This function will be necessary when you accept this mainboard, or the system CMOS data is corrupted.

```
ROM PCI/ISA BIOS(2A69KPA9)
CMOS SETUP UTILITY
AWARD SOFTWARE, INC.
┌──────────────────────────────────────────────────────────────┐
│  STANDARD CMOS SETUP          SUPERVISOR PASSWORD              │
│                                                                │
│  BIOS FEATURES SETUP          USER PASSWORD                    │
│                                                                │
│  CHIPSET FEATURES SETUP       IDE HDD AUTO DETECTION           │
│                                                                │
│  POWER MANAGEMENT SETUP       HDD LOW LEVEL FORMAT             │
│                        ┌──────────────────────────┐            │
│  PNP/PCI CONFIGURA     │  Load SETUP Default(Y/N)? Y │ ETUP     │
│                        │                          │            │
│  INTEGRATED PERIPH     └──────────────────────────┘ SAVING     │
│                                                                │
│  LOAD SETUP DEFAULTS                                           │
├──────────────────────────────────────────────────────────────┤
│ ESC: QUIT                   ↑ ↓ →  SELECT ITEM                 │
│ F10:Save & Exit Setup       (Shift)F2 :Change Color            │
├──────────────────────────────────────────────────────────────┤
│         Load Setup Defaults Except Standard COMS SETUP         │
└──────────────────────────────────────────────────────────────┘
```

LOAD SETUP DEFAULTS